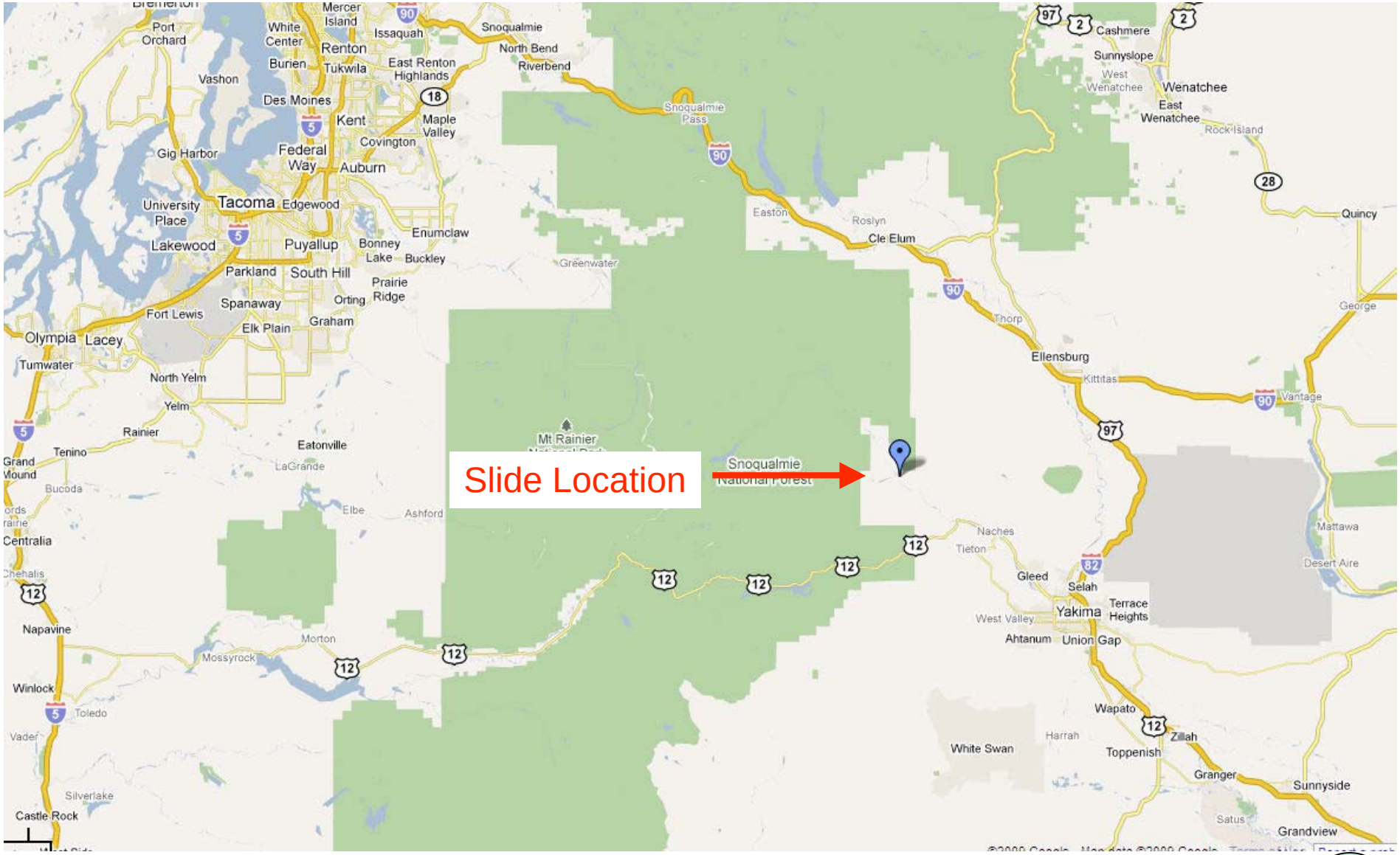
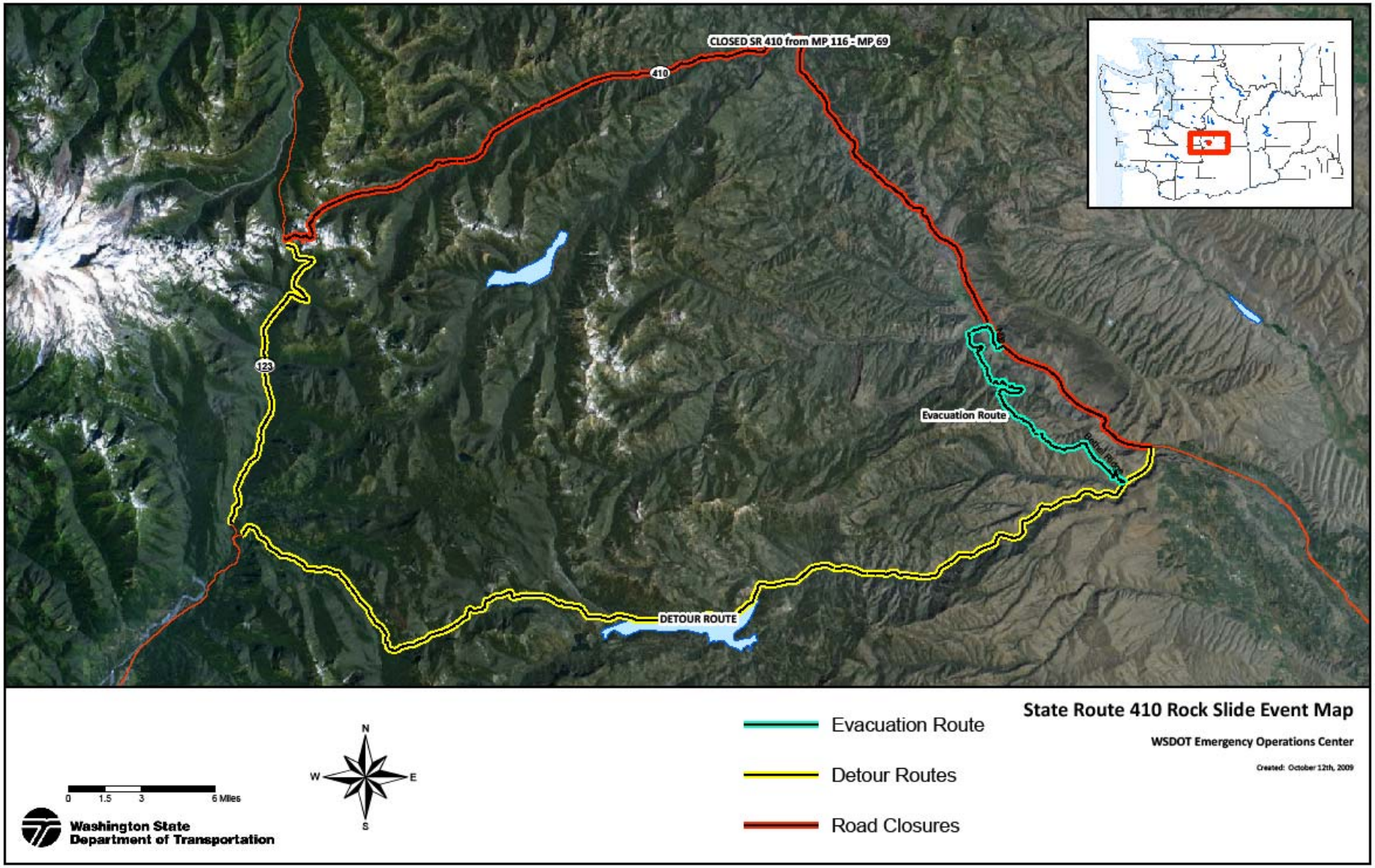
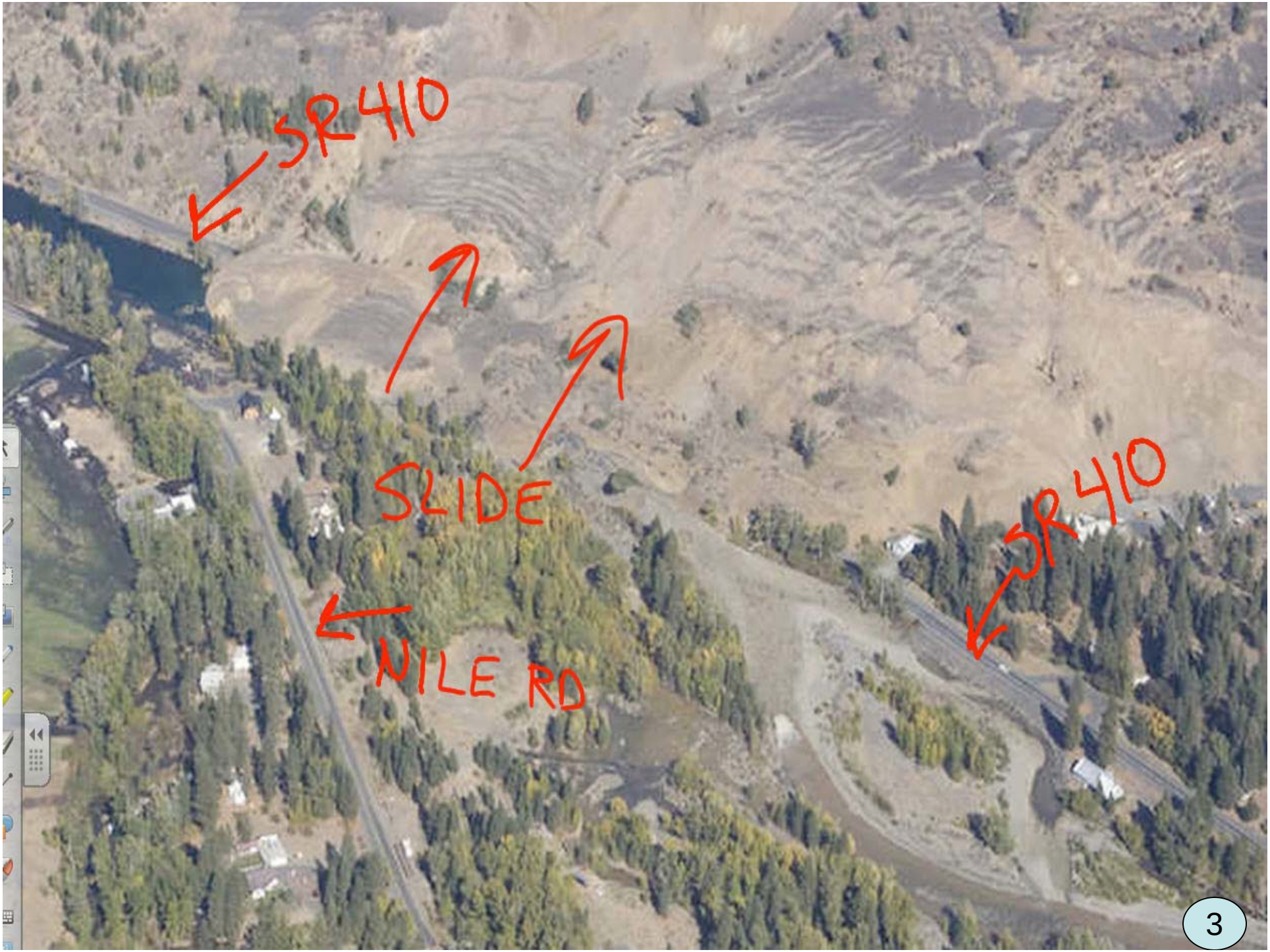
SR 410 Nile Valley Landslide

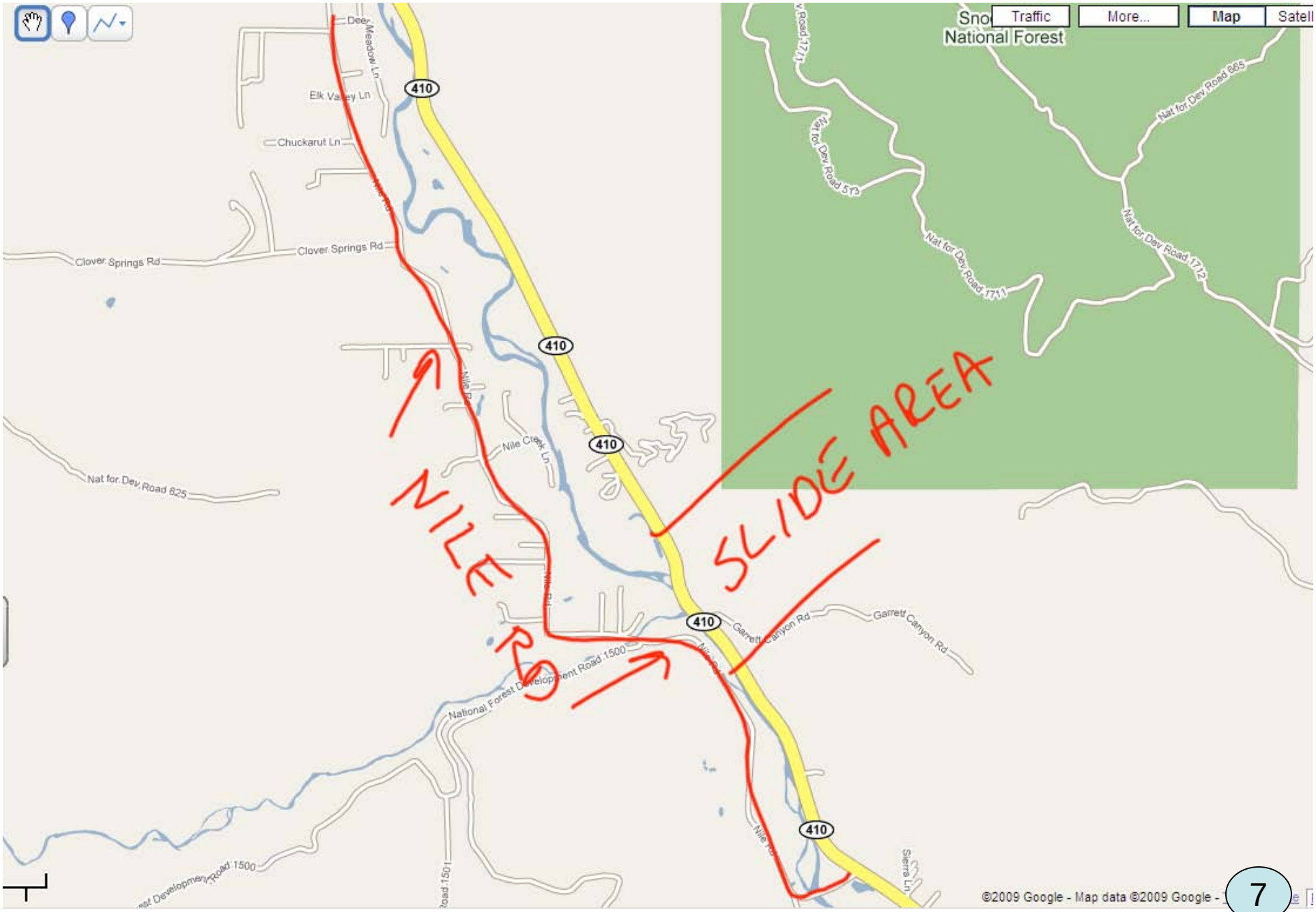



CLOSED SR 410 from MP 116 - MP 69
410
123
Evacuation Route
DETOUR ROUTE
State Route 410 Rock Slide Event Map
WSDOT Emergency Operations Center
Created: October 12th, 2009
Evacuation Route
Detour Routes
Road Closures
N
W
E
S
0 1.5 3 6 Miles
Washington State
Department of Transportation


SR 410
SLIDE
NILE RD
SR 410


SR 410
Nile Rd
SR 410


SR 410
Nile Rd


Traffic
More...
Map
Satell
National Forest
Nat for Dev Road 665
Nat for Dev Road 513
Nat for Dev Road 1711
Nat for Dev Road 1712
410
Deer Meadow Ln
Elk Valley Ln
Chuckarut Ln
Clover Springs Rd
Clover Springs Rd
Nile Rd
Nile Creek Ln
Nat for Dev Road 825
Garrett Canyon Rd
Garrett Canyon Rd
National Forest Development Road 1500
Nile Rd
Sierra Ln
NILE RD
SLIDE AREA
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Washington State Department of Transportation

SR 410 Nile Valley Landslide

Briefing
October 17, 2009

Governor Christine Gregoire
Secretary Paula Hammond, P.E.
Washington State Department of Transportation

WSDOT keeps people and business moving by operating and improving the state's transportation systems.

Washington State Department of Transportation

SR 410 Nile Valley Landslide

Overview

At 6 a.m. on Sunday, Oct. 11, 2009, Washington State Department of Transportation (WSDOT) closed SR 410 when a quarter-mile section of the highway was uplifted and pushed into the Naches River. The hillside continued to move throughout the day, destroying property, redirecting the river, and eventually obliterating a section of the Nile Loop Road, the only viable detour route through the area.

By Monday afternoon, environmental and geo-technical experts indicated it was safe to begin work re-establishing the Nile Loop Road as a temporary emergency access. This would allow access to essential services for approximately 1,500 local residents living above the slide area.

On Tuesday, workers, dump trucks and other large machinery arrived and began placing several culverts, roadway fill material and a crushed rock driving surface to create the emergency access road. Also on Tuesday, Gov. Gregoire issued a proclamation directing state agencies and departments to utilize state resources to assist recovery efforts for the affected areas. WSDOT shortened the SR 410 closure from 47 miles to four miles and made significant progress on the temporary emergency access road.

By Friday evening, the emergency access work on the Nile Loop Road was complete, allowing local access through the slide area.

Challenges

- The immediate emergency access road just completed is a temporary but necessary solution to allow access to the area and connect the 1,500 residents of the community to essential services.

- WSDOT is certain that under normal seasonal flows in the Naches River, this temporary roadway will be damaged or completely destroyed. An interim solution which will provide an all-weather road surface across the valley is underway. This interim step is necessary to ensure that access is available throughout the winter.

- The toe of the slide is becoming saturated due to the ponding effect, a result of the blocked river channel. It will then become less stable over time. This issue, in combination with the likelihood of increased flows in the Naches River, points to the need to establish an interim roadway away from the river and the slide.

Next Steps

- Several alternatives have been evaluated related to establishing an interim roadway that will last throughout the winter.
- The recommended alternative (Alternative "B") is to re-align a 0.9 mile section of the Nile Loop Road across the valley from the slide, and away from the Naches River.
- We are working with affected property owners to secure permission to construct the interim re-alignment of the Nile Loop Road.
- Work is continuing on re-establishing a flow channel for the Naches River around the base of the slide. This work is necessary to provide increased flow capacity for the Naches River.
- Paving will begin the week of October 26th on the upper end of the Nile Loop Road to prepare it for the additional traffic it will receive when the lower end is realigned.

Cost Estimates of Work Necessary for Interim Repair

Emergency Response		$100,000
Lower Nile Loop Road Emergency Access Construction Cost to-date: Estimated cost to complete:	 $200,000 $50,000	$250,000
Paving Upper Nile Loop Road		$1,000,000
Naches River – Channel Work		$100,000
Construct Interim Roadway		$5,000,000
Property Acquisition		$1,000,000
Landslide Detection Radar		$400,000
Total Estimated Cost:		**$7,850,000**

Other Alternatives Considered

Existing Nile Loop Road Alternative (Alternative "A")

Description: Expand the existing emergency repairs to Nile Loop Road by armoring and elevating existing roadway from existing Naches River Bridge to withstand high river flows.

Challenges: The Naches River has changed course due to the slide and is currently pinched between the slide area and Nile Loop road. Current river levels are at their low point for the year and will only increase. Normal flows at the end of November are nearly 6 times the current river flow. Even under these low flows, all indications show the river moving toward the Nile Loop Road in this location. It is extremely likely that the current emergency access now being constructed will be destroyed during normal high flows in the Naches River. Building upon a roadway that is so close to a new river channel carries extreme risks for future flood damage.

Estimated Cost - $3-4 million

Existing SR 410 (Over-the-slide) Alternative (Alternative "C")

Description: Re-establish a temporary roadway over the slide along the existing SR 410 alignment.

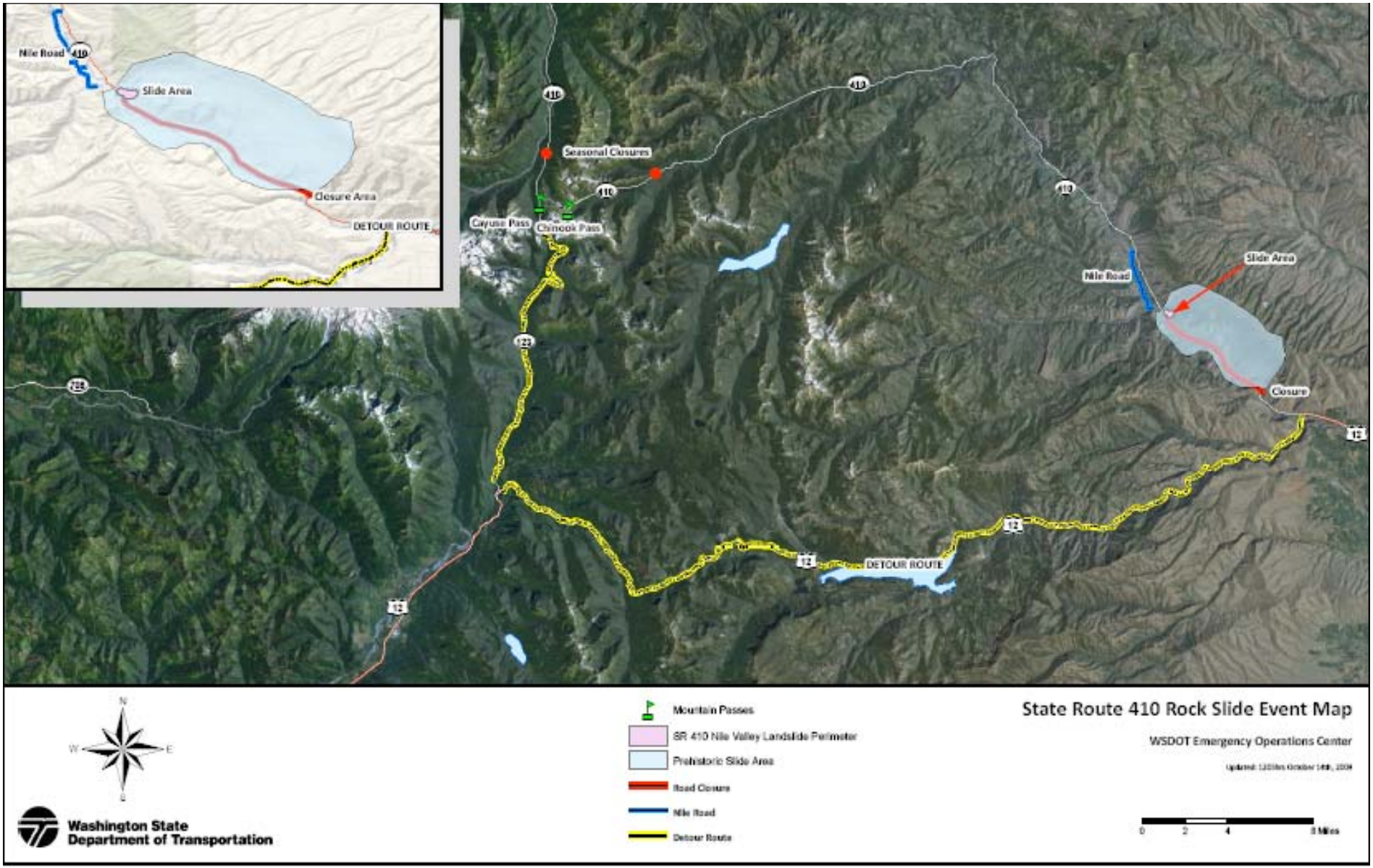
Challenges: The stability of the slide is unknown. Until we can determine the slide stability, this alternative is not feasible due to safety concerns. This alternative would not supply through access for residents on Nile Loop Road.

Estimated Cost: Undetermined, as Not Recommended

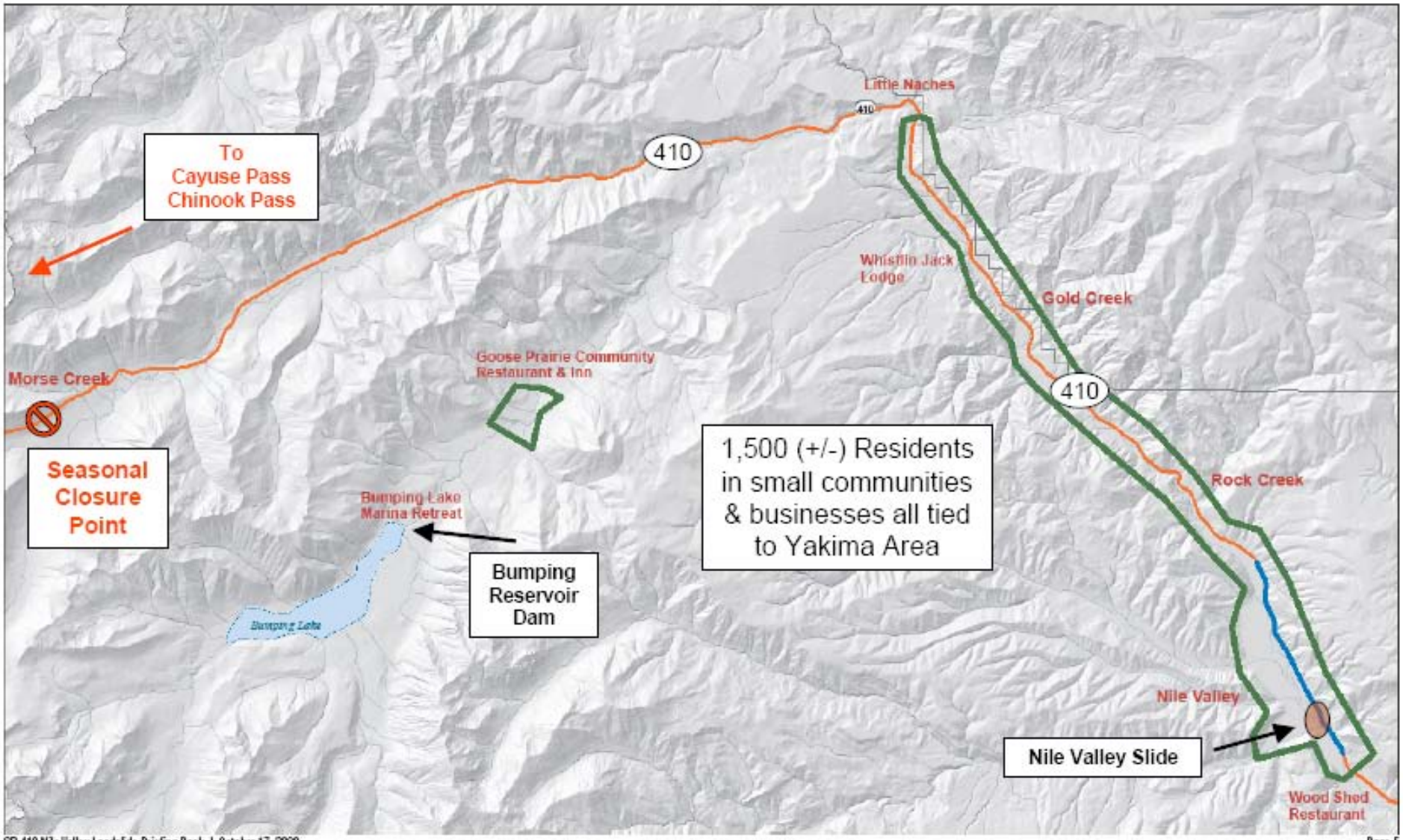
Permanent Solution Planning

WSDOT has begun preliminary analysis of permanent solutions for re-establishing SR 410 through this area. Formal environmental analysis must first be accomplished before a final solution is selected.

Possible options could include constructing the new SR 410 over the landslide to creating a new roadway utilizing portions of Nile Loop Road that would include two new bridges over the Naches River. Early estimates range from $20 to 45 million for these options.


Nile Road
410
Slide Area
Closure Area
DETOUR ROUTE
Seasonal Closures
Cayuse Pass
Chinook Pass
122
123
12
Slide Area
Nile Road
Closure
DETOUR ROUTE
Washington State
Department of Transportation
Mountain Passes
SR 410 Nile Valley Landslide Perimeter
Prehistoric Slide Area
Road Closure
Nile Road
Detour Route
State Route 410 Rock Slide Event Map
WSDOT Emergency Operations Center
0
2
4
8 Miles

SR 410 - Morse Creek to Nile Valley



SR 410 Chinook Pass

Date taken: April 2006

- Average Snowfall: 548 inches*
- **Unsafe for workers and travelers**
- Extreme Avalanche Danger
- Frequent and lengthy closures
- $1M per year for 13 additional FTEs
- $1.5M in additional equipment

* Data provided by the Northwest Avalanche Center

SR 410 – Nile Valley Landslide

On Oct. 11, a massive landslide demolished a half-mile of SR 410 15 miles west of Naches. The landslide pushed significant amounts of earth and pavement into the Naches River, destroying at least two homes and changing the river's course. Dozens of nearby residents were evacuated because of potential flooding. The cause of the slide is unknown.

10/11/2009

10/11/2009

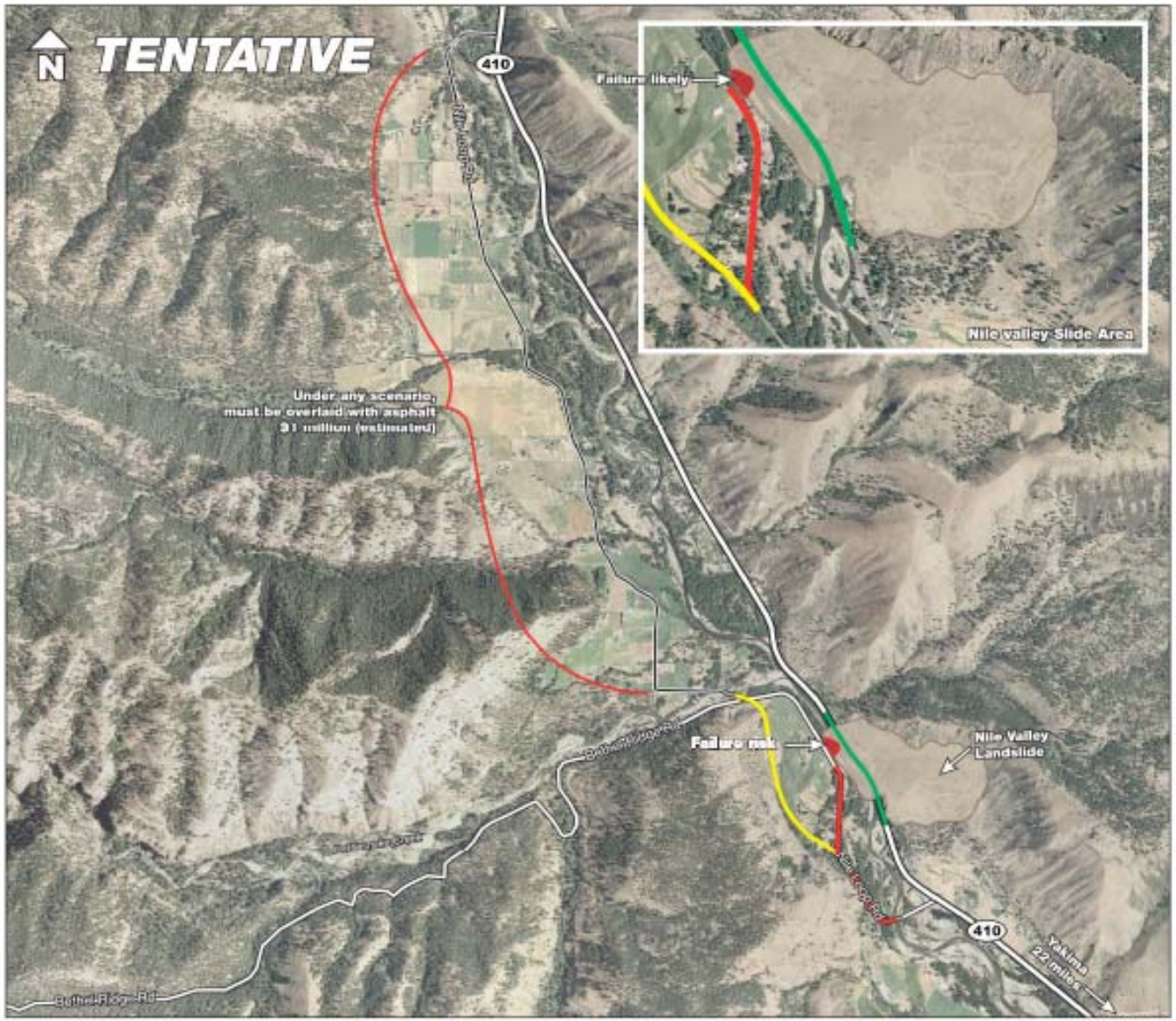
Paved roadway — Gravel roadway

LEGEND

Alternative A
Alternative B
Alternative C

0 0.25 0.5 1 Miles

Washington State Department of Transportation



Modified: 10/13/2009


Potential new channel
Must purchase and remove to open channel
Must purchase and remove to open channel
Failure risk
Landslide
Culverts
Danger pool of back water
400 cfs Friday
700 cfs this weekend
2000 cfs average November
410

SR 410 – Nile Valley Landslide
Alternatives

Immediate Solutions

WSDOT is elevated the roadway and added culverts to temporarily restore access.

WSDOT will elevate the roadway to temporarily restore access. Culverts will be added to assist the existing box culvert in this location

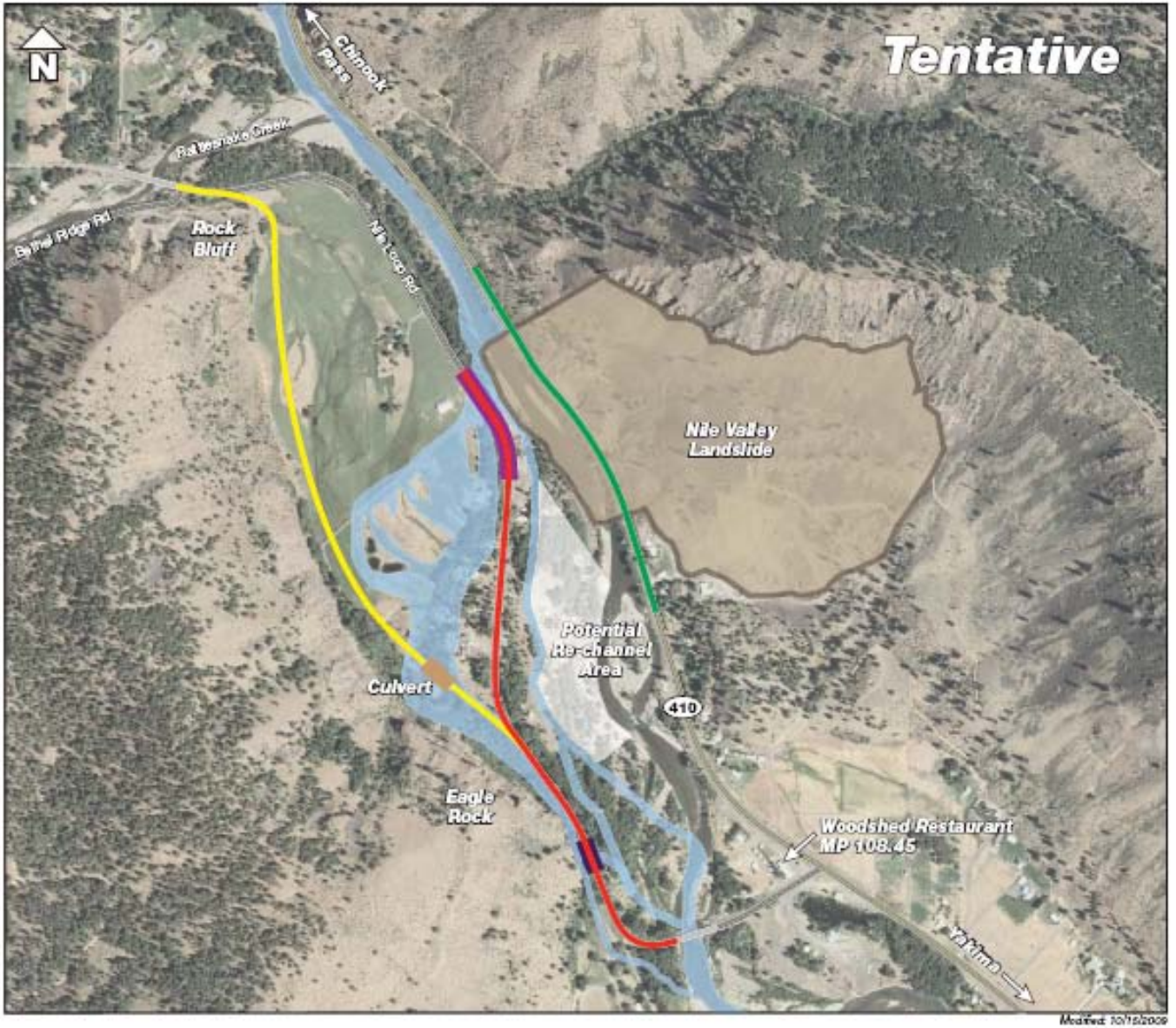
Alternative A
Alternative B
Alternative C

Current River Path

Potential Re-channel

0 600 1,200 2,400 Feet

Washington State Department of Transportation



Modified: 10/15/2009